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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/036,696	12/31/2001	Joshua J. Malone	TI-29278	4951
23494	7590	05/20/2004	EXAMINER	
TEXAS INSTRUMENTS INCORPORATED P O BOX 655474, M/S 3999 DALLAS, TX 75265				THOMAS, BRANDI N
			ART UNIT	PAPER NUMBER
			2873	

DATE MAILED: 05/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)
	10/036,696	MALONE, JOSHUA J.
Examiner	Art Unit	
Brandi N Thomas	2873	<i>pw</i>

-- The MAILING DATE of this communication app ars on the cover sheet with the correspond nce address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 1 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

1) Responsive to communication(s) filed on Amendment filed on 2/20/04.

2a) This action is **FINAL**.                    2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

4)  Claim(s) 1-3 and 5-36 is/are pending in the application.  
4a) Of the above claim(s) 8-15 and 22-36 is/are withdrawn from consideration.

5)  Claim(s) \_\_\_\_\_ is/are allowed.

6)  Claim(s) 1-3,5-7 and 16-21 is/are rejected.

7)  Claim(s) \_\_\_\_\_ is/are objected to.

8)  Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

9)  The specification is objected to by the Examiner.

10)  The drawing(s) filed on 31 December 2001 is/are: a)  accepted or b)  objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)  The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)  Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a)  All    b)  Some \* c)  None of:  
1.  Certified copies of the priority documents have been received.  
2.  Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3.  Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

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**Attachment(s)**

1)  Notice of References Cited (PTO-892)  
2)  Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3)  Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.  
4)  Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.  
5)  Notice of Informal Patent Application (PTO-152)  
6)  Other: Detailed Action.

**DETAILED ACTION**

***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-3, 5-7, and 16-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Imanaka et al. (4954480) in view of Brooks et al. (6326244 B1).

Regarding claims 1 and 2, Imanaka et al. teaches a method of forming a package substrate, the method comprising: providing sheets of substrate layers (col. 4, lines 49-50); forming metalized patterns on at least one of said sheets (col. 4, lines 37-39); laminating said sheets to form said package substrate (col. 4, lines 28-51) except that it does not show separating sheets to form individual package substrates and a cavity having a floor defining a reference plane. Brooks et al. shows that it is known to provide a cavity formed in the substrate having a floor defining a reference plane, wherein said layers are shaped to expose limited regions of said reference plane outside said cavity for permitting the use of a flexible, tape-type base laminate in the package (col. 4, lines 23-30). It would have been obvious to one of ordinary skill in the art at the time the invention was made to separate the sheets to form individual package substrates for the purpose of aligning and precisely positioning the micromirrors. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Imanaka et al. with the cavity and reference plane of Brooks et al. for the purpose of permitting the use of a flexible, tape-type base laminate in the package (col. 4, lines 23-30).

Further regarding claim 2, Brooks et al. further discloses, as in figures 1 and 2, the cavity surrounded by substrate walls (col. 4, lines 37-39).

Regarding claim 3, Imanaka et al. discloses, as in figures 1 and 2A, wherein said laminating said sheets comprises laminating said sheets to form a package substrate, said sheets shaped to expose regions of said reference plane to a surface of said package substrate parallel to said reference plane (col. 4, lines 39-45).

Regarding claim 5, Imanaka et al. discloses wherein said forming metalized patterns on at least one of said sheets comprising forming metalized patterns on at least one of said sheets to provide electrical connection throughout the sheets of the substrate except that it does not specifically discloses an electrical interconnection with the cavity. It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide an electrical connection between the cavity and an external surface of said package substrate this being reasonably based upon the material of the substrate being superconductive from the metalized layer (col. 4, lines 33-42).

Regarding claim 6, Imanaka et al. discloses wherein said providing substrate sheets comprising: providing ceramic substrate sheets (col. 4, lines 14-27).

Regarding claim 7, Imanaka et al. discloses the claimed invention except for plastic substrate sheets. It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the substrate sheets of plastic, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use (In re Leshin, 125 USPQ 416). It would have been obvious to someone of ordinary skill in the art at the time the invention was made to use plastic as a material for the

substrate sheets for the purpose of plastics capability of being deformed and molded continuously and permanently in any direction without rupture.

Regarding claim 16, Imanaka et al. discloses a package substrate, comprising: a first surface (3 and 5; insulating layers); a second surface opposing said first surface (2) but does not disclose a cavity open to said second surface, said cavity having a floor defining a reference plane; and regions outside said cavity exposing a discrete portions of a surface of said reference plane. Brooks et al. shows that it is known to provide a cavity open to said second surface, said cavity having a floor defining a reference plane; and regions outside said cavity exposing a discrete portions of a surface of said reference plane for permitting the use of a flexible, tape-type base laminate in the package (col. 4, lines 23-30). Therefore it would have been obvious to someone of ordinary skill in the art at the time the invention was made to combine the teaching of Imanaka et al. with the cavity and reference plane of Brooks et al. for the purpose of permitting the use of a flexible, tape-type base laminate in the package (col. 4, lines 23-30).

Regarding claim 17, Imanaka et al. discloses, as in figures 1 and 2A, a package substrate, wherein said regions outside said cavity expose a surface of said reference plane from a second side corresponding to said second surface (col. 4, lines 39-45).

Regarding claim 18, Imanaka et al. discloses, as in figures 1 and 2A, a package substrate, wherein said regions outside said cavity expose a surface of said reference plane from a side corresponding to said first surface (col. 4, lines 39-45).

Regarding claim 19, Imanaka et al. discloses said package substrate formed of a laminated series of layers, said regions formed by voids (disclosed as holes) in said layers on one side and the top and bottom side of said reference plane (col. 4, lines 30-33).

Regarding claim 20, Imanaka et al. discloses a package substrate, said package substrate formed of a laminated series of layers, said regions formed by voids in said layers on a side of said reference plane corresponding to said second surface (col. 4, lines 30-40) but does not disclose a cavity. Brooks et al. shows that it is known to provide a cavity for permitting the use of a flexible, tape-type base laminate in the package (col. 4, lines 23-30). Therefore it would have been obvious to someone of ordinary skill in the art at the time the invention was made to combine the teaching of Imanaka et al. with the cavity and reference plane of Brooks et al. for the purpose of permitting the use of a flexible, tape-type base laminate in the package (col. 4, lines 23-30).

Regarding claim 21, Imanaka et al. discloses a package substrate, said package substrate formed of a laminated series of layers, said regions formed by voids in said layers on a side of said reference plane corresponding to said first surface (col. 4, lines 30-40) but does not disclose a cavity. Brooks et al. shows that it is known to provide a cavity for permitting the use of a flexible, tape-type base laminate in the package (col. 4, lines 23-30). Therefore it would have been obvious to someone of ordinary skill in the art at the time the invention was made to combine the teaching of Imanaka et al. with the cavity and reference plane of Brooks et al. for the purpose of permitting the use of a flexible, tape-type base laminate in the package (col. 4, lines 23-30).

### ***Conclusion***

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

McLellan et al. (US 23002/0068378 A1) discloses a method of fabricating an integrated circuit package for ball grid arrays.

Koshio (6392143 B1) discloses a flexible package which includes a flexible substrate on a principal surface which a plurality of metal wirings are formed.

Horiuchi et al. (4827083) discloses a ceramic package including a high thermal conductive ceramic substrate.

***Response to Arguments***

4. Applicant's arguments with respect to claims 1-3, 5-7, and 16-21 have been considered but are moot in view of the new ground(s) of rejection.

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brandi N Thomas whose telephone number is 571-272-2341. The examiner can normally be reached on 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Epps can be reached on 571-272-2328. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



BNT  
May 17, 2004



RICKY MACK  
PRIMARY EXAMINER